

In the Drawings:

Enclosed is a sheet of drawings containing Figs. 8 and 9, which applicants propose to introduce.

R E M A R K S

Claims 1-6 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

Applicants introduce new Claims 14 and 15 as reciting a series of successive steps.

The Examiner's objection directed to Claim 12 is not understood.

Claims 1, 6, 7, and 12 have been rejected under 35 U.S.C. 102(b) as being clearly anticipated by Bose.

Claim 1 has been rewritten as new Claim 14 to distinguish over Bose.

Bose effectively discloses a method of attenuating external origin noise reaching the eardrum comprising the steps of placing around each ear passive soundproofing means 15 which delimits a cavity 12; placing in said cavity a microphone 11 and an electro-acoustic transducer 17; interconnecting said microphone and said transducer by an electronic feedback loop including a constant gain amplifier 35 and filters.

Concerning the filters, Bose only teaches (Column 5, Line 5) that "The compensation block 2 comprises an active filter characterized by magnitude and phase characteristics that ensure stability of the feedback loop without appreciably compromising the overall loop gain".

Fig. 7 shows a block diagram of a compressor which comprises a low pass filter 55.

The low pass filter is an averaging filter classically connected to the output of a full wave rectifier whose function is very different from the function of the filters placed in the feedback loop of the present application.

Bose does not teach that the feedback loop comprises a filter having a complex polynomial transfer function, and does not teach any means for measuring the open loop transfer function between the transducer and the microphone nor any means for calculating the coefficients of the polynomial transfer function of the filter so that the product of the constant gain K of the amplifier by the modulus of the open loop transfer function and by the modulus of the transfer function of the filter be much greater than unity over a range of frequencies which is the range in which the passive sound-proofing means are less effective (low frequencies).

As for the objection directed to Claim 6, this claim has been rewritten as new Claims 20 and 21.

As for the rejection of Claim 7, applicants wish to point out that it is not anticipated by Bose which does not disclose or teach a filter having a complex polynomial transfer function so that the product of the modulus of said transfer function by the modulus of the open loop transfer function and by the gain of the amplifier is much greater than unity.

Since Claim 12 is dependent from Claim 7, it points up a subsidiary feature and should be allowable.

Claim 12 comprises a limitation that the transducer forms a plug which is engaged in the inlet of the external ear duct, which is not disclosed or taught by Bose.

Claims 3, 4, and 11 have been rejected under 35 U.S.C. 103 as being unpatentable over Bose considered with U.K. 2,160,070.

Plessey discloses devices which comprise an earphone having a transducer, a microphone and an electronic feedback loop between the microphone and the transducer.

This feedback loop includes at least a mixing amplifier and a high gain phase-inverting amplifier.

Fig. 4 shows an embodiment comprising two filters 24, 26, but each of these filters is placed before a boost amplifier which amplifies the speech signal. These filters are not included in the feedback loop and do not have the same function as the filter of the present application.

So it appears that Plessey in view of Bose do not disclose or teach a method for calculating the transfer function of a filter included in the feedback loop.

Concerning the rejection of Claim 11, this claim should be allowable since it is dependent from Claim 7 which has been distinguished over the prior art.

Claim 11 contains a limitation of an annular part 15 interposed between the partition 7 and the pinna of the ear having determined dimensions, and this feature is new and unobvious over Bose in view of Plessey.

The Examiner has objected to Claims 2, 8, 9, 10, and 13 as being dependent from a rejected base claim.

The new Claim 15 corresponds to prior Claims 1 and 2.

The new Claims 17, 18, and 19 correspond, respectively, to prior Claims 8, 9, and 10, which have been made independent of Claim 7.

New Claim 16 is based on former Claims 3 and 5 and is appended to the new Claim 14.

Applicants wish to thank the Examiner for the favorable consideration of the subject matter in Claims 3, 4, and 11.

In view of the Examiner's objection to Claims 8, 9, and 13, as reciting limitations which are not illustrated in the drawings, applicants submit a drawing sheet containing Figs. 8 and 9.

Fig. 8 shows filter means comprising two analog filters 12a and 12b connected in parallel. The two filters 12a and 12b can be band-pass filters as explained on Page 16, Lines 23-35.

Alternatively, filter 12a can be a low-pass filter and filter 12b a pass-band filter as explained on Page 15, Lines 23-26.

Fig. 8 corresponds to Claim 17.

Fig. 9 corresponds to Claim 18 and to Claim 13 appended to Claim 17.

Fig. 9 shows three filters 12a, 12b, and 12c, connected in parallel. Filter 12a is a low-pass filter, filter 12b is a pass-band filter, and filter 12c is a high-pass filter.

Preferably filters 12a, 12b, and 12c have the same cut-off frequency and the same Q factor.

Fig. 9 corresponds to the examples disclosed on Page 16, Line 36, to Page 17, Line 32.

In practice, as explained on Pages 14, 15, and 17, the filter means 12 consists of integrated circuits associated with variable resistors which are adjusted to set the coefficients a_1 , a_2 , and a_3 of the numerator of the polynomial transfer function of the filter, and the coefficients a_1 , a_2 , and a_3 are chosen to obtain filter means which have the same effect as a mixture of low-pass, high-pass, and pass-band filters connected in parallel.

Applicants wish to point out that the disclosures of Figs. 8 and 9 should be not be considered as addition of new matter.

In the event that the Examiner should have a contrary view, it is possible for the applicants to amend Figs. 3 and 6 to include into the box 12, two or three filters 12a, 12b, 12c, connected in parallel as shown in new Figs. 8 and 9.

In view of the extensive revisions effected in the claims and the arguments presented herein, applicants respectfully request the Examiner to favorably reconsider the merits of this application.

With regard to the fee involved for additional claims, we enclose herewith, a check for \$102.00 to cover the cost of three independent claims in excess of three.

Respectfully submitted,

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I hereby certify that the information contained in this document was obtained from the United States Postal Service and is being furnished to the Commissioner of Patents and Trademarks for his information.

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October 5, 1988
October 5, 1988

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